Interferometric science

- What is the current state of affairs?
  - Extremely limited (according to non-interferometrists)
  - Limited (according to interferometrists)

- Why is this so?
  - Sources are faint — Large (?) telescopes required
  - Physics comes thru spectroscopy — Need for high photon fluxes
  - Sources come in varying sizes — Need scaleable array
  - Sources are complex — Need large amount of phase information
  - Sources change, surveys desirable — Requires an automated array

- Implications:
  - Scientific exploitation has been limited by facilities available
  - It is not a feature of ground-based interferometry per-se

Possible routes forward

- Build a “Grand Design” interferometer
  - The equivalent of the VLA, VLBA, or ALMA
    - Expensive & time consuming
- Build a less ambitious but scientifically attractive array
  - Must deliver good science
  - Must deliver broad science
  - Must realize this on a suitably short timescale
- What type of arrays are possible?
  - Purely astrometric array
  - Non-astrometric array
    - Bright and simple sources
    - Faint and simple sources
    - Bright and complex sources
    - Faint and complex sources

A minimum science capability

- Model-independent astrophysics
  - 10 x 10 imaging with moderate resolution spectroscopy (R ~ 100)
- Critical science targets
  - AGN
    - At least several tens of these
    - Optical observations (Hα) desirable
  - Young Stellar Objects
    - Examples in the nearest high and low-mass star forming regions
    - In each case many tens of targets
    - Optical and infrared measurements
  - Stars
    - Most main-sequence types
    - More importantly, many tens of examples of “exotic” types - Cepheids, LPVs, Symbiotics, WR stars, Be stars etc

Things to do (and not to do)

- Don’t expect long-term collaborative programmes now
  - Too many projects are in mid-phase and have widely differing foci
- Don’t initiate new projects that will not help deliver this minimum science portfolio.
- Collaborate today on:
  - Identification of most suitable targets for interferometers
  - Development of theoretical models that recognize what interferometry can measure
  - Education of the non-interferometric community so that they understand what interferometry will deliver
  - Joint observing campaigns